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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,236	10/28/2003	Thomas Lloyd Credelle	8831.0056-01	5279

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EXAMINER

MOON, SEOKYUN

ART UNIT PAPER NUMBER

2629

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,236

Applicant(s)

CREDELLE, THOMAS LLOYD

Examiner

Seokyun Moon

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 1 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. **Claims 1 and 10** are objected to because of the following informalities: "the said signals" disclosed in claim 1 and "read and green subpixels" disclosed in claim 10. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1, 6, 8, 13, and 15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation disclosed in the claims, "*image data and polarity signals*" is indefinite since it can be interpreted as either "image data signals and polarity signals" or "image data signals having polarities".

As best understood by examiner, the claim limitation will be interpreted as "*image data signals having polarities*" for further examination purpose.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2629

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 2, 6, 8, 9, 13, 15, 16, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (U.S. Pat. No. 6,326,981 B1, herein after referred to as "Mori") in view of Okuzono et al. (U.S. Pat. No. 6,727,878 B2, herein after referred to as "Okuzono").

As to **claim 1**, Mori teaches a liquid crystal display [abstract] comprising:

a panel [drawing 1 disclosed in page 5 of this office action, which is equivalent to Mori's fig. 15] substantially comprising a subpixel repeating group (the subpixels included in a rectangular box with solid lines shown in drawing 1) comprising an even number of subpixels in a row, said subpixel repeating group further comprising a column of dark colored subpixels (the subpixels included in a rectangular box with dotted lines shown in drawing 1); and

a driver circuit sending image data signals to the panel [col. 10 lines 3-13];

Mori does not disclose expressly the data signals having polarities.

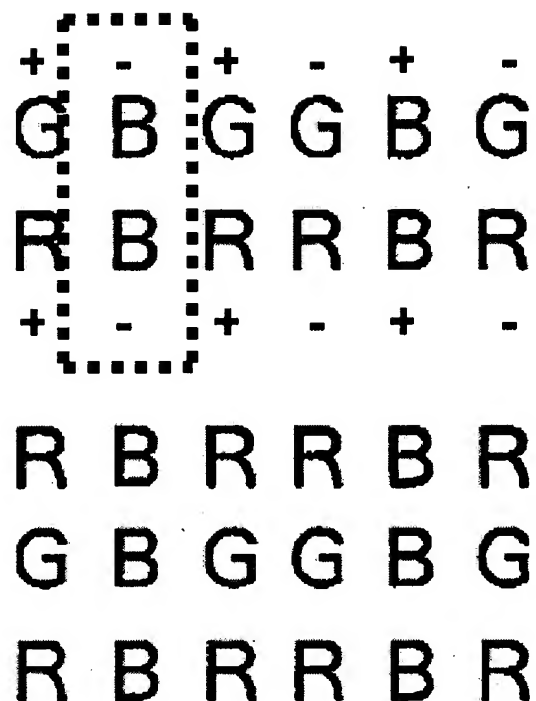
However, Okuzono [fig. 2] teaches a liquid crystal display which is driven with data signals having specific polarities [col. 5 lines 47-50].

It would have been obvious to one of ordinary skill in the art at the time of the invention to drive Mori's display with image data having the polarities taught by Okuzono, to mask the dull portions of the voltage waveform of the data lines [col. 4 lines 54-63].

Mori modified by Okuzono does not expressly disclose any image gradation of said signals to be localized on said column of dark colored subpixels.

However, by adopting Okuzono's method of applying polarities to the subpixels in Mori, the signals with same polarity are applied to adjacent blue subpixels included in a column, as shown in drawing 2. Since two adjacent blue subpixels are driven with a same polarity, the image degradation is only occurred on the blue subpixels while the image degradation is not occurred on any other subpixels having different colors (i.e. red or green) since red or green subpixels are not adjacent to the subpixels having same colors when they are driven with a same polarity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to disclose any image gradation (caused by driving two adjacent subpixels having a same color with a same polarity) in driving signals to be localized on a column of dark colored subpixels (blue subpixels), in modified Mori by Okuzono.



Drawing 2

As to **claim 6**, most of the claim limitations have already been discussed with respect to the rejection of claims 1 and 2 except for a driver circuit having at least two phases.

The modified Mori [Okuzono: fig. 2] discussed with respect to the rejection of claim 1 teaches a driver circuit having at least two phases (“*positive, negative, positive, negative, ...*” for “n” and “n+1”th lines and “*negative, positive, negative, positive, ...*” for “n+2” and “n+3”th lines), wherein phases of the driver circuits are selected such that any

parasitic effect (caused by driving two adjacent pixels having a same color with a same polarity) placed upon any subpixels are placed substantially upon said column of blue subpixels.

As to **claim 8**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 9**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 13**, all of the claim limitations have already been discussed with respect to the rejection of claim 6.

As to **claim 15**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 16**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

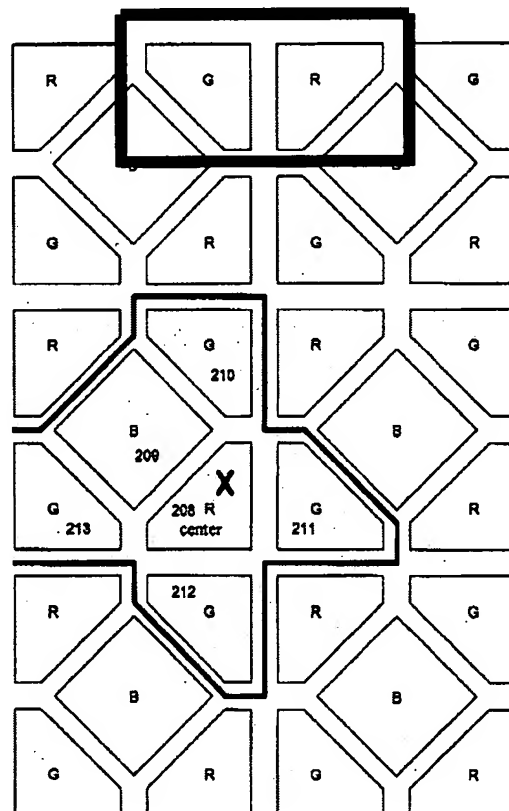
As to **claim 20**, all of the claim limitations have already been discussed with respect to the rejection of claim 6.

6. **Claims 3, 4, 10, 11, 17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori and Okuzono as applied to claim 1 above, and further in view of Martin et al. (U.S. Pat. No. 6,714,206 B1, herein after referred to as "Martin").

As to **claim 3**, the modified Mori [drawing 1] teaches said subpixel repeating group (the subpixels included in a rectangular box with solid lines shown in drawing 1) substantially comprising red and green subpixels interspersed with two columns of blue subpixels.

The modified Mori does not expressly disclose a checkboard of red and green subpixels interspersed with two columns of blue subpixels.

However, Martin [drawing 3 of this office action, which is equivalent to fig. 2] teaches an arrangement of placing two subpixels (the subpixels included in the rectangle shown in drawing 3) of two different pixels having different colors adjacent to each other rather than placing two subpixels of two different pixels having same colors adjacent to each other.



It would have been Drawing 3 the art at the time of the invention to adopt Martin's red and green subpixel arrangement in the modified Mori, to provide a uniform color illumination by placing two subpixels of two different pixels having different colors in each row.

As to **claim 4**, Mori modified by Okuzono [Okuzono: fig. 9] teaches said two columns of blue subpixels share a same column driver ("*source driver 106*").

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claims 4 and 8.

As to **claim 17**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 18**, all of the claim limitations have already been discussed with respect to the rejection of claim 11.

7. **Claims 5, 7, 12, 14, 19, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori and Okuzono in view of Nakano et al (U.S. Pub. No. 2001/0052897 A1, herein after referred to as "Nakano").

Mori does not disclose one or more subpixels to receive a correction signal.

However, Nakano [fig. 2] teaches a principle of applying a correction signal to subpixels to adjust / compensate the offset occurred among three subpixels with different colors when a gray scale level of any 6-bit data are applied to the subpixels [par. 0041].

It would have been obvious to one of ordinary skill in the art at the time of the invention to include Nakano's method / principle of applying correction signals to the subpixels which have relatively low luminance values in Ikeda, in order to equalize the luminance value of a subpixel with a color with the luminance value of another subpixel

Art Unit: 2629

with different color, thus to provide an image with more precise brightness for the display.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ikeda et al. (U.S. Pat. No. 6,552,706 B1) teaches an active matrix type liquid crystal display apparatus reducing occurrence of flicker, which can be a cause of degradation of picture quality.

Robinder (U.S. Pat. No. 5,485,293) teaches an active liquid crystal multi-colored display panel structure of triangular triads of colored display pixels.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 26, 2006

S.M.

AMR A. AWAD
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", written over the printed name and title.